

ACHYRANTHES JAPONICA (MIQ.) NAKAI
(AMARANTHACEAE)
IN KENTUCKY AND WEST VIRGINIA:
NEW TO NORTH AMERICA

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On 26 August 1981 a plant unknown to them was collected by HB and JM on the banks of Tug Fork of the Big Sandy River at Warfield, Martin County, Kentucky (Bryan & MacGregor *s.n.*, DHL). Although identification to family—Amaranthaceae—and genus—*Achyranthes*—posed no problem, the specimens were not convincingly identifiable to species in pertinent eastern North American floristic works (Fernald 1950, Gleason 1952, Gleason and Cronquist 1963, Radford et al. 1968, Robertson 1981, Small 1933, Standley 1917, Steyermark 1963, Strausbaugh and Core 1978.)

According to Robertson, in his account of Amaranthaceae for Vascular Flora of the Southeastern United States (unpublished), *Achyranthes* in the southeast is represented by a single species, *A. aspera*, L., with two subspecies (recognized as two species, under *Centrostachys*, by Standley [1917]). Our specimens did not fit the descriptions of either of these subspecies. We finally concluded, however, that they did fit descriptions of

an Asiatic species, *A. japonica* (Miq.) Nakai (Liu and Kao 1976, Ohwi 1965); they matched the illustration of this species in Liu and Kao (1976). Our tentative identification was verified by comparison with authentic specimens of *A. japonica* from Honshu, Japan, that we borrowed from US. Our specimens (Fig. 1a, b, c) appear to represent var. *hachijoensis* Honda and are, we believe, the first from North America. According to Liu and Kao (1976), *A. japonica*, in addition to its occurrence on Taiwan, is "widely distributed in China, the Ryukyus, Japan and Korea and the temperate and subtropical regions of southeastern Asia."

We have since collected the species in Lawrence County (3 mi S of Louisa, 7 Nov 1982, *Medley, Hotchkiss, & Woodward* 7160-82, DHL) and Pike County (along Tug Fork in river birch woods, ca 3 miles NW of South Williamson, 9 Sep 1984, *Medley s.n.*, DHL), Kentucky, and in Mingo County, West Virginia (wooded banks of Tug Fork, ca 3 miles S of Kermit, 13 Aug 1982, *Medley* 6082-82, DHL). It occurs as open colonies of individual plants up to 1.5 m tall on wooded river banks in areas that have an incomplete or light canopy and that are annually flooded. Dominant species in the community at the Martin County site included *Betula nigra*, *Microstegium vimineum*, *Pilea pumila*, and *Boehmeria cylindrica*. This shady habitat of *A. japonica* is in contrast to that of *A. aspera*, which grows in open waste places and on roadsides (Walker 1976).

Dispersal of *A. japonica* in Kentucky and West Virginia appears to be accomplished largely by water. However, at the Lawrence County site in early November, when the infructescences were fully elongated (quite reminiscent of those of *Phryma leptostachya*) and the seeds were mature, the fruiting calyces—each with its accompanying subulate-spinose bracteoles—detached from the plants and clung to clothing, indicating an adaptation to dispersal by animals. (Zoochory, for *A. aspera*, was described by Bullock and Primack [1977].)

The origin of *A. japonica* on Tug Fork is unknown. It was possibly via the major railroad that parallels the watercourse at the site where the species was first found.

This species will probably be found eventually in all Kentucky and West Virginia counties bordering Tug Fork and the lower Big Sandy River; it may ultimately be found along the banks of the Ohio River downstream from the mouth of the Big Sandy. In time it may also move up the tributary valleys of Tug Fork and the Big Sandy via transport by small mammals and fall migrant birds.

The two species of *Achyranthes* now known to occur in the conterminous United States can best be separated on the basis of characteristics of their staminodes, as follows: *A. aspera*—staminodes fimbriate at apex (Fig. 1d);

A. japonica—staminodes entire to denticulate or slightly notched at apex (Fig. 1c).

As an aid to other workers who find *A. japonica* we present the following description of the species, which is based on our Kentucky and West Virginia material.

Herb (reported as perennial; Liu and Kao 1976, Ohwi 1965, Walker 1976). Stem erect or ascending, sometimes becoming decumbent late in the season, 75-150 cm tall, glabrous to lightly pubescent, 4-angled, vertically 12-lined (2 lines per angle, 1 line per face). Leaves simple, opposite, blades oblong-elliptic, 2.5-13.5 cm long, 1.2-6.8 cm wide,

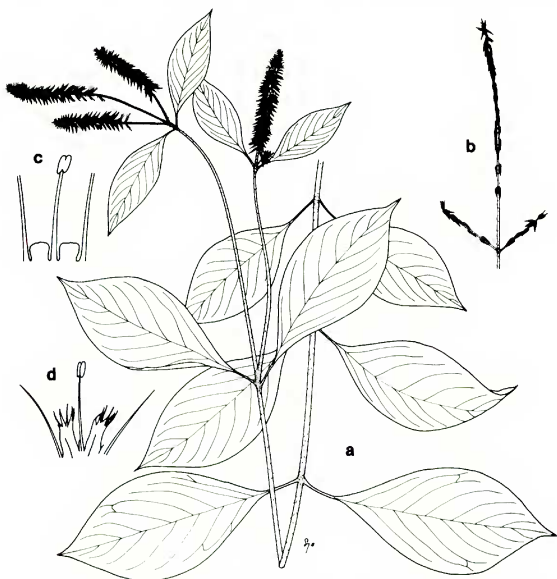


Figure 1. *Achyranthes japonica*. a, upper part of plant, $\times 0.4$; b, inflorescence, $\times 0.4$; c, staminodes and stamens, $\times 14$. *A. aspera*. d, staminodes and stamens, $\times 14$.

pinnately veined (veins opposite to alternate), short pubescent above, pubescent on veins below, apex acute to acuminate, margin entire; petioles 0.4–3.5 cm long. Inflorescence spicate, terminal on main stem and upper branches, erect, many flowered; spikes 2–4 cm long and compact in early flower, elongating to 21 cm and becoming more open, especially proximally, in mature fruit. Flowers perfect, regular, hypogynous, apetalous, sessile, divergent at right angles in anthesis, sharply deflexed in mature fruit, then becoming as much as 1.5 cm apart in lower part of spike; each flower subtended by a membranous bract ca 2 mm long and by 2 rigid, subulate-spinose bracteoles 3–4 mm long, each bracteole with 2 basal, suborbicular, membranous auricles, the bracteoles and the flower falling as a unit; sepals 5, linear-lanceolate, 4–5 mm long, acuminate; stamens 5, alternating and connate below with 5 entire, denticulate, or slightly notched staminodes. Fruit a 1-seeded utricle, oblong, 2.5 mm long, 1 mm wide, tipped by the slender style, this 1 mm long.

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